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Computerized mapping gives towns new tool

Using multiple layers of data, GIS has variety of applications

By Richard Higgins
GLOBE STAFF

From speeding up building permits and fighting crime to deciding where to site new schools or day-care centers, computerized mapping systems are emerging in the towns south of Boston as a powerful, new tool in municipal planning, finance, and environmental management.

Although geographical information systems, or GIS, have been in use in cities across the nation for a decade, New England as a region and smaller municipalities in particular have been slower to catch on.

However, with a drop in software prices, a vast array of cutting-edge applications, and growing support from regional planning groups, the number of Massachusetts cities and towns using GIS has doubled in the last five years.

Why? GIS can place many layers of data — showing aquifers, undeveloped lots, election wards, bird habitats, sewer lines, and school districts as well as drug arrests, oil spills, septic systems, and traffic accidents — on a single color-coded map, allowing planners to spatially analyze a problem, according to Slater W. Anderson, former GIS manager for the Metropolitan Area Planning Council.

"Costs have come down, and awareness of GIS and its potential has gone way up," bringing about a "remarkable growth" in the number of communities with GIS staff and systems, said Anderson, who recently left MAPC for a job in the private sector. (His replacement, Allan C. Bishop, began Sept. 1.)

Five years ago, there was one full-

time GIS manager at the municipal level in the state. Today, 15 cities or towns have full-time GIS managers or coordinators, including Sharon, Dedham, Walpole, and West Bridgewater.

In addition, Bridgewater, Brockton, Duxbury, Kingston, Foxborough, Norton, Scituate, Stoneham, and Wareham have either purchased GIS software or have a part-time GIS manager.

Six other towns south of Boston — Hanson, Hull, East Bridgewater, Plymouth, Norwood, and Raynham — indicated in a recent survey conducted by the MAPC that they would purchase GIS software within two years. Finally, Stoughton recently commissioned a GIS needs assessment study.

For all of these communities, the ap-

peal of GIS is its ability to quickly integrate information with location.

"It's been incredibly useful, both as an organizing tool and way to increase productivity," said Charlie Sanchez, GIS coordinator for Sharon. "The question is, how did we get along without it?"

Sanchez said that jobs that used to take two to three days can now be done in a half-hour.

An example, he said, would be creating a street layout that locates rights of way, utility lines, topographical information, and edge-of-pavement lines for streets, sidewalks, and curb cuts, all in one map.

"We always had that information, but it was in the form of hard prints scattered



GLOBE STAFF PHOTO / GEORGE RIZER
Charlie Sanchez, GIS coordinator, watches as a soil survey map of Sharon rolls off a printer.

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in different storage bins. We had to spend a lot of time literally tracing one map over another. Now it's all right there in front of you, on one map."

Sanchez, who works for Sharon's Department of Public Works, said that the town Engineering Department has four countertop terminals at which GIS specialists can make maps for the public.

Other uses area communities have made of GIS technology include identifying and notifying abutters affected by building permits or zoning changes, producing maps for prosecutors showing the 1,000-foot "drug-free zones" around schools in certain communities, and identifying lots that, based on a number of clues, are at risk of having a smaller home knocked down to make way for a bigger one.

Walpole took advantage of its GIS software this year when the town was interested in buying the former Adams Farm, on which a new housing subdivision was proposed. Because it was a Chapter 61 property, the town had the right of first refusal on the land.

Mark Jones, the GIS manager for the town, said that his office created a map showing not just the land in question but how its preservation would protect a town aquifer, a wetland area, a wildlife habitat, and historic structures located within it. In April, the map was displayed on a large screen at a special Town Meeting, which approved the purchase.

The GIS technology was also instrumental in helping the town win a \$300,000 self-help grant from the state to go forward with the purchase, said Jones.

Jones said that Walpole's GIS database has been "extremely useful" both for residents or business people interested in buying or developing a property. He also said that awareness of the potential of GIS as a tool in town planning has "increased tremendously" among town officials, who he said are coming to him more and more often for help.



GLOBE STAFF PHOTO / GEORGE RIZZI

In the Sharon DPW engineering department, GIS technician Jennifer Rose looks over a computer printout.

'It's a time-saver to have all the information different departments need in one shared repository.'

NEIL MacGAFFEY, GIS administrator for the City of Newton

Newton was the first municipality in the state to use GIS extensively and remains a leader in municipal applications. Its GIS database is run on a UNIX system but can be accessed on desktop personal computers used in City Hall.

Between 1995 and 1997, the number of users within City Hall doubled and stands today at 25 in nine departments, according to Neil MacGaffey, GIS administrator for the city.

Last year, city finance officials wondered if Newton needed a third ambulance. To answer that, they

needed to know not just the number of 911 calls but where they were coming from. Because Newton is large, if one ambulance was tied up or out of service, the other ambulance would have to cover a huge area, creating a potential lag in response time.

So they turned to MacGaffey, who took a list of addresses of emergency ambulance responses and plotted them on a GIS map. What he found was that, while the 911 calls were clustered at assisted living facilities, those clusters were evenly distributed across the city. The decision was then made, he said, to purchase a third ambulance.

The more complex the question, such as how a school redistricting proposal would affect the number of bused students and the routes the buses would take, the more useful GIS can be.

"It's a time-saver to have all the information different departments need in one shared repository," MacGaffey said. One of the things that makes GIS appealing is that it takes

advantage of data a community already has, he added.

Newton also has countertop GIS terminals in the engineering, building, and tax departments at City Hall to make maps available to the public. Louis Mazzola, who works in engineering during the summer, said that he makes 20 to 25 maps a day, charging customers from \$1 to \$10, depending on the size.

Contractors, lawyers, and property owners are frequent customers, he said. Tax assessor's maps of parcels, topographical surveys, and maps showing school zones or utility lines are often requested, he said. The terminals were put in 18 months ago. "When the word got out that you could make maps in engineering, people really started coming in," he said.